

CHAPTER VI: REPAIRS AND NEW CONSTRUCTION

PIPE

Steel and plastic pipe specifications applicable to operators of small natural gas systems are included in this manual. Pipe specifications are listed below. Be sure to check Appendix A of 49 CFR Part 192 for the current specifications and standards.

API 5L - Steel pipe

ASTM A53 - Steel pipe

ASTM D2513 - Thermoplastic pipe and tubing

Operators are cautioned that the actual maximum allowable operating pressure (MAOP) of a new or replacement pipe in a natural gas system is determined by a pressure test performed on the pipeline system by the operator before it is put in service. It is also recommended that threaded pipe not be installed underground.

When purchasing PE plastic pipe, the pipe must be marked ASTM D2513. Plastic pipe with this marking is the only PE pipe suitable for gas service.

Plastic pipe and tubing should be protected at all times from damage by crushing, piercing, or extended exposure to direct sunlight. As a rule of thumb, never store plastic pipe outdoors for more than six months. It should be placed inside or covered to protect it from exposure to direct sunlight. It is a good idea to obtain the manufacturer's recommendation on how long the pipe can be exposed to sunlight before it loses physical strength. See 49 CFR §192.321 for more information.

In recent years, the vast majority of natural gas companies and operators of natural gas system have been installing ASTM D2513, PE pipe. Some of the reasons PE pipe is being installed are flexibility, good joining characteristics, durability, ease of installation,

and cost. The PE type designations most often used are PE 2406, and PE 3408. (See Figure VI-14.)

Figure VI-14

A picture of 4-inch SDR 11 PE pipe manufactured according to ASTM D2513. When using plastic pipe in the underground piping system, make sure it has ASTM D2513 stamped on it.

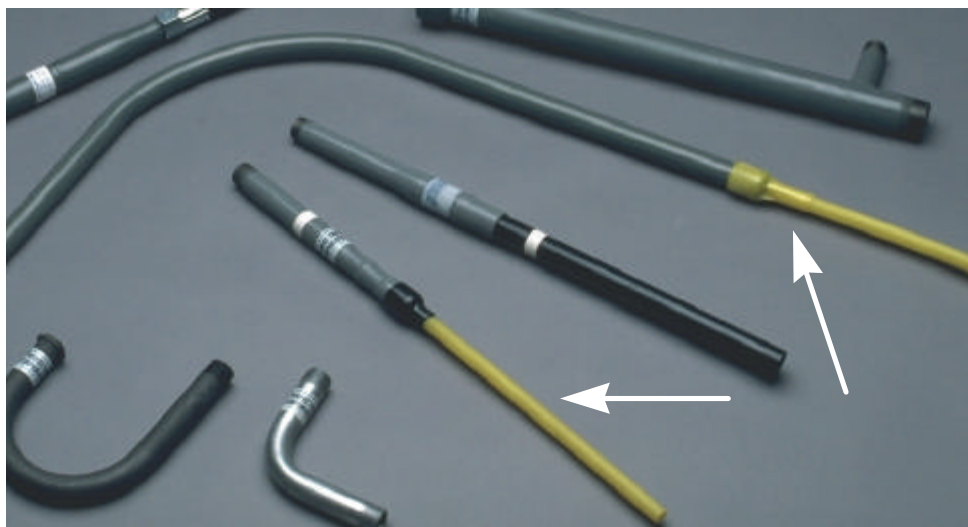


An anodeless riser is a transition fitting that permits plastic service lines to be brought aboveground in compliance with 49 CFR §192.375. The regulations require plastic services to be installed below ground level, except that it may terminate aboveground, outside of buildings, if the plastic pipe is protected from deterioration and damage and it is not used to support external loads. Anodeless risers are readily available from various manufacturers and suppliers and are either fully fabricated from the manufacturer, or are field-fabricated by the installer, as is the case with service head adapter risers. Typically, the external protective casing is pre-bent, epoxy coated or galvanized, schedule 40 steel pipe. The plastic gas piping (inside the casing) must extend to an aboveground point for the riser to qualify as anodeless. Otherwise the riser casing becomes a buried steel pipe gas carrier and is required to comply with Subpart I of 49 CFR Part 192. In most cases there is a grade level or “do not bury” label to indicate the bury depth to the installer. The outlet typically is provided with tapered pipe threads, or in the case of commercial or industrial risers, a bolted flange for attachment to the meter valve. The polyethylene piping inlet, designated as the “pigtail”, is provided ready for connection to the service

line. This service connection is accomplished either by heat fusion or, if so specified, with a mechanical coupling already attached to the pigtail for additional installation convenience.

Figure VI-15

Examples of anodeless service risers. There are many different manufacturers of anodeless risers. The primary advantage of an anodeless riser is that it does not have to be cathodically protected because the outside steel casing is not the gas carrier. The plastic inside the steel casing is the gas carrier. When purchasing anodeless risers, make sure that they meet all DOT requirements. When installing steel risers connected to plastic pipe by a transition fitting, make sure that the steel riser is coated and cathodically protected.



Most PE pipe manufacturers subscribe to the "Standard Dimension Ratio" (SDR) method of rating pressure piping. The SDR is the ratio of pipe diameter to wall thickness. An SDR 11 means the outside diameter (O.D.) of the pipe is eleven times the thickness of the wall.

For high SDR ratios the pipe wall is thin in comparison to the pipe O.D. For low SDR ratios the wall is thick in comparison to the pipe O.D. Given two pipes of the same O.D., the pipe with the thicker wall will be stronger than the one with the thinner wall. High SDR pipe has a low-pressure rating; low SDR pipe has a high-pressure rating. The operator should check the manufacturer's specific pressure rating for each specific pipe. Do not use pipe with SDR values greater than 11.

PE pipe must be joined by either the heat fusion method (butt, socket, or electrofusion) or by a mechanical coupling. Each joining procedure and each person making joints must be qualified.

For information about local suppliers of plastic gas pipe, contact the local gas utility.